EMARAAT

WHERE AFFORDABILITY MEETS DURABILITY

COMPANY PROFILE



CONTENT

1) Quality Management

2) Quality Assurance

3) Emaraat PVC Piping System

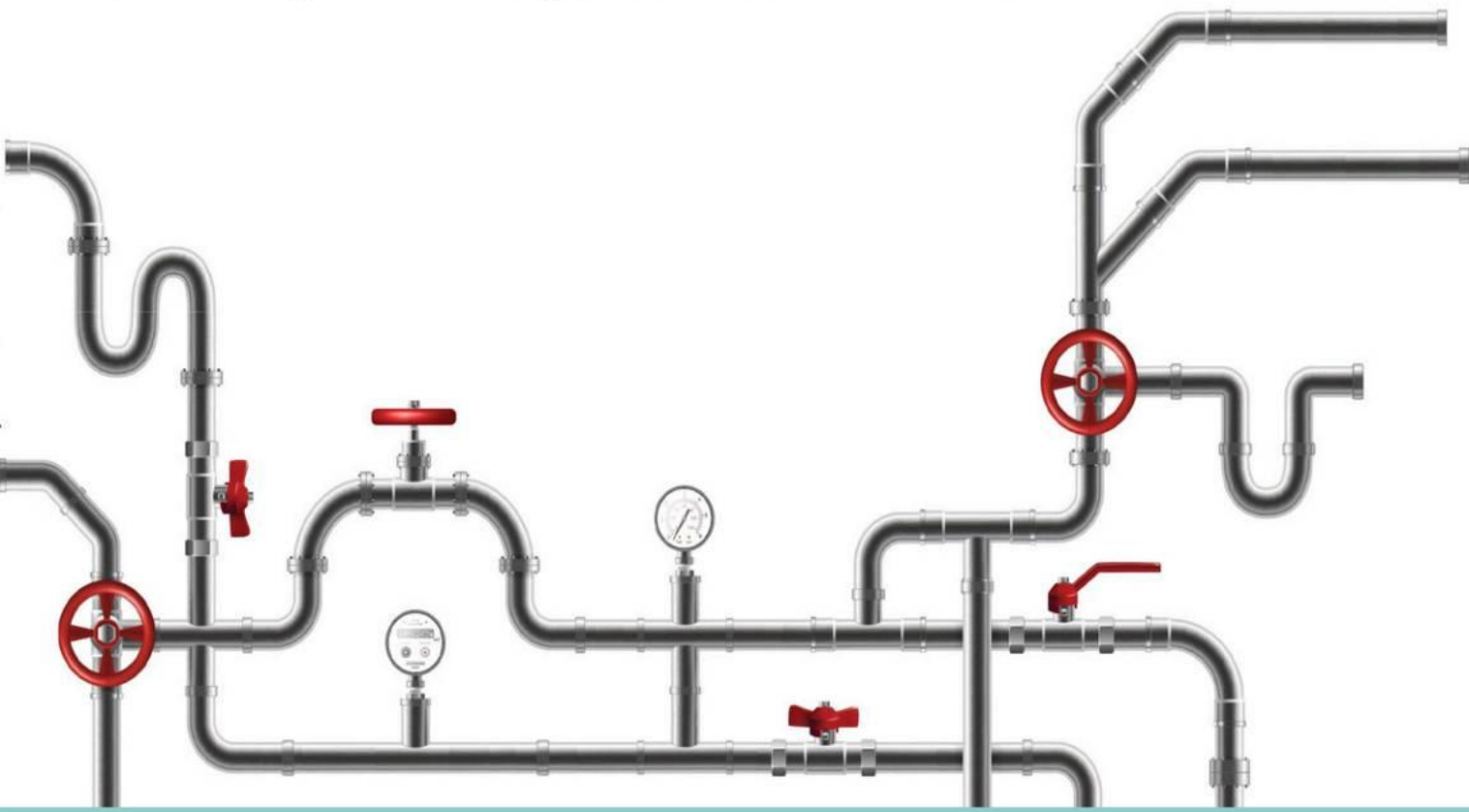
4) Material Properties

5) PVC Chemical Resistance Chart

6) PVC Pipe Process Flow Chart

7) Standard Dimensions and Weight

8) Storage & Holding /Installation Process



QUALITY MANAGEMENT SYSTEM

Emaraat has established and maintained quality management system compliance with ISO 9001, 2008 standard to control all the operations like order processing, designing, production, starting with the selection of raw material till the final inspection and delivery.

The qualified and experienced personal carry out the inspection and testing at all stages of the manufacturing process for quality control & assurance to meet the customer needs and expectations.

The international and national third party inspection companies would also be organized to inspect the Emaraat product mix at various stages of production to gain the customers confidence and satisfaction.

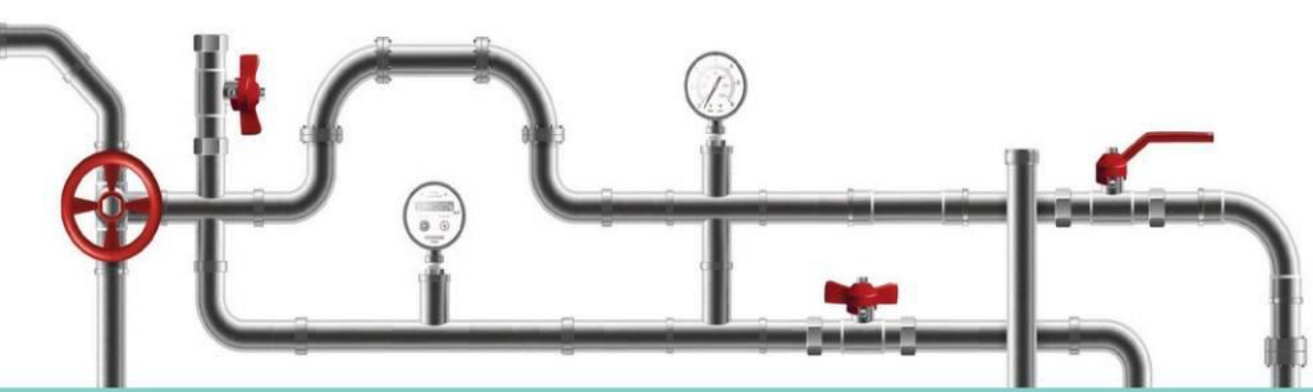


QUALITY POLICY

"All our commitments, actions and products are geared to achieve customer satisfaction and to fulfill their requirements".

OBJECTIVES

1. To produce the product of internationally recognized standards and specifications.
2. To be cost effective and efficient organization.
3. To minimize customer complains.
4. To establish, maintain and continuously improve quality management system.



QUALITY ASSURANCE

Our facilities for full line of pipes and fittings to Hydrostatic pressure test as per the design data, to check the suitability of the product to the application.
Our laboratory is well facilitated to confirm that the products manufactured are to standard specifications. Our high performance extruders with advanced process control and monitoring system permit increased rate of production over the entire diameter ranges, adhering to the highest quality.
Our high technology moulding machines with advance automated tooling permit high volume production of fittings with exceptionally high consistency in term of dimensional accuracy, mechanical strength and surface finish.

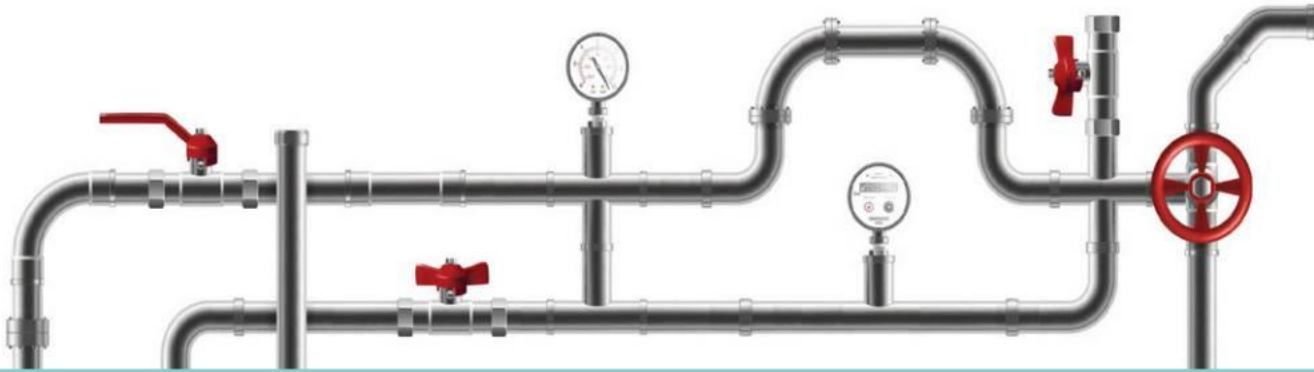


Our sophisticated quality control and Assurance procedure and advanced manufacturing techniques work hand-in-hand to assure the highest quality and dimensional consistency in PVC piping systems.

QUALITY TEST FOR PIPES IN IBEX LAB

- Heat Revision and De-Lamination Tests
- Methylene Chloride Test
- Hydrostatic Test
- Impact Test
- Fracture Toughness Test
- Opacity Test
- Specific Gravity Test
- Dimension Measurement
- Visual Inspection
- Bending Test
- Hardness Test
- Stiffness Test





Emaraat PVC PIPING SYSTEM

I Emaraat PVC piping system offer a comprehensive range of pipes and fitting to cater to growing need of the water, sewerage, building construction industry.

STANDARDS

All PVC pipes and fittings are manufactured as per the following standards.

- UPVC Schedule 40 pipes are manufactured in strict compliance with ASTM D-1785.
- CPVC Schedule 40 pipes are manufactured in strict compliance with ASTM F-441.
- Pressure rated (SDR Series) pipes are manufactured in strict compliance with ASTM D-2241.
- All PVC pipes are produced from compound which confirms ASTM D-1784.
- All fittings for above pipes according to ASTM D-2466 & D-2665.
- Hydrostatic Test
- Impact Test
- Fracture Toughness Test
- Opacity Test

RANGE

Emaraat UPVC & CPVC Pipes & Fittings are available **in following sizes:**

- UPVC Pipes (Schedule 40) = ½" to 12"
- UPVC Pipes (SDR Series) = 2" ~ 8"
- CPVC Pipes (Schedule 40) = ½" ~ 1"
- PVC Electric Conduit Pipes = ½" ~ 4"

ADVANTAGES OF IBEX PVC PIPING SYSTEM

1. Easy to Install
Tough, Impact-resistance and easy to install.

2. Corrosion Resistance
UPVC is non-corrosive and hence constant with water does not deteriorate the material.

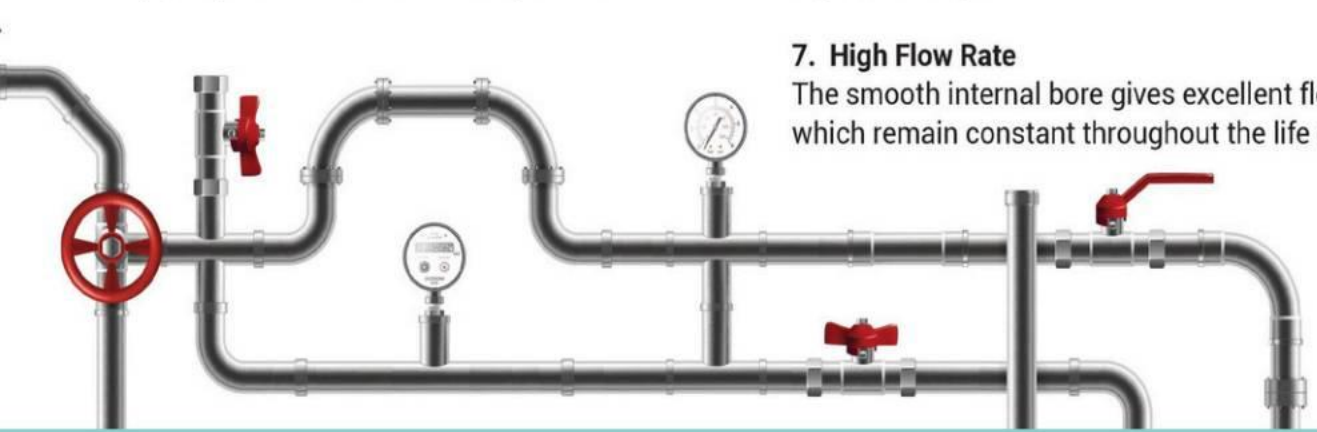
3. Chemical Resistance
Excellent chemical resistance of UPVC to acids, alkalis and oxidizing.

4. Non-inflammable
UPVC does not support combustion and is self-extinguishing.

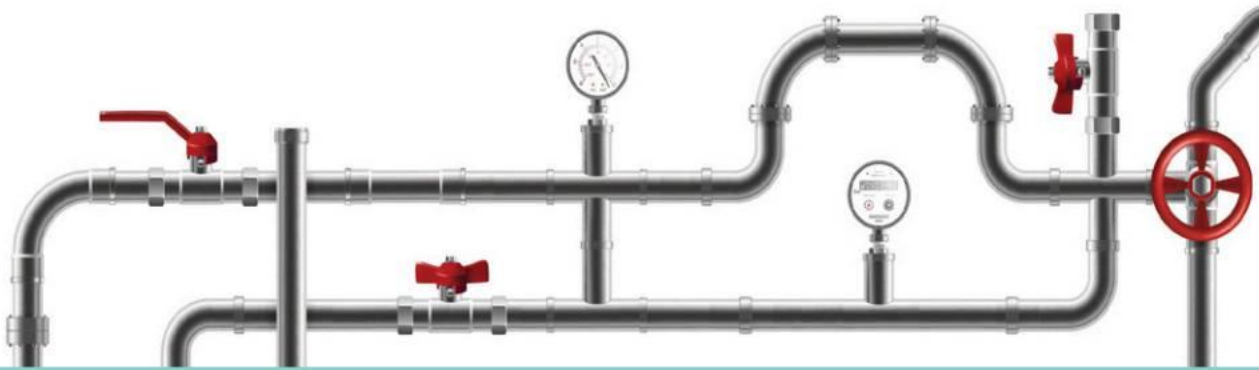
5. Non-Conductive
UPVC is a non-conductor and hence not attacked by galvanic or electrolytic action.

6. Weather Resistance
Specially blended UV stabilized compound offers an excellent outdoor weathering performance.
High durability.

7. High Flow Rate
The smooth internal bore gives excellent flow properties which remain constant throughout the life of the system.







MATERIAL PROPERTIES

MATERIAL			
Unplasticized Polyvinyl Chloride (UPVC)			
GENERAL PROPERTIES			
Specific Gravity		1.38 - 1.43	gm /cm3
Water Absorption		< 4	gm /cm2
Oxygen Index		45	45
Flammability		Self Extinguishing	
Oxygen Penetration		< 1	cm3 / m.day.bar
THERMAL PROPERTIES			
Heat Distortion Temperature @ 4.64 Kgf / cm2		70 - 80	°C
Heat Distortion Temperature @ 18.56 Kgf / cm2		70 - 73	°C
Max. Operating Temperature		60	°C
Specific Heat		0.20 - 0.28	Cal / g.°C
Thermal Conductivity		0.12 - 0.14	Kcal / m.h.°C
Coefficient of Linear Expansion		6.7x10-5 - 7.9x10-5	cm / cm.°C
MECHANICAL PROPERTIES			
Tensile Strength	@ 73 oF	480 - 525	kgf /cm2
Compressive Strength	@ 73 oF	655 - 675	kgf /cm2
Flexural Strength	@ 73 oF	880 - 950	kgf /cm2
Impact Strength		4 - 4.5	joules
Modulus of Elasticity	@ 73 oF	2.9 x 104 - 3.16 x 104	kgf /cm2
Relative Hardness (Rockwell)		110 - 120	R
ELECTRICAL PROPERTIES			
Volume Resistively		> 1 x 1014	ohm / cm
Surface Resistively		> 1 x 1014	ohm / cm
Power Factor (At 10 Cycles)		3.0	

UPVC is a non conductor of electricity and also non subject to galvanic or electrolytic attack.
Electrical equipment

COLOR: WHITE

MATERIAL PROPERTIES

MATERIAL			
Chlorinated Polyvinyl Chloride (CPVC)			
GENERAL PROPERTIES			
Specific Gravity		1.52 - 1.55	gm /cm3
Water Absorption		< 7	gm /cm2 @ 73 oF
Oxygen Index		60	45
Flammability		Self Extinguishing	
Oxygen Penetration		< 1	cm3 / m.day.bar
THERMAL PROPERTIES			
Heat Distortion Temperature @ 4.64 Kgf / cm2		110 - 117	°C
Heat Distortion Temperature @ 18.56 Kgf / cm2		100 - 103	°C
Max. Operating Temperature		93	°C
Specific Heat		0.2 - 0.28	Cal / g.°C
Thermal Conductivity		0.1 - 0.13	Kcal / m.h.°C
Coefficient of Linear Expansion		8.3x10-5 - 8.9x10-5	cm / cm.°C
MECHANICAL PROPERTIES			
Tensile Strength	@ 73 oF	550 - 580	kgf /cm2
Compressive Strength	@ 73 oF	690 - 720	kgf /cm2
Flexural Strength	@ 73 oF	1010 - 1080	kgf /cm2
Impact Strength		4 - 4.5	joules
Modulus of Elasticity	@ 73 oF	2.53 x 104 - 2.82 x 104	kgf /cm2
Relative Hardness (Rockwell)		117 - 119	R
ELECTRICAL PROPERTIES			
Volume Resistively		> 1 x 1014	ohm / cm
Surface Resistively		> 1 x 1012	ohm / cm
Power Factor (At 10 Cycles)		3.0	

UPVC is a non conductor of electricity and also non subject to galvanic or electrolytic attack.
Electrical equipment should not be earthened to (CPVC) pipes.

COLOR: LIGHT GRAY

PVC CHEMICAL RESISTANCE CHART

CHEMICAL	73o F(23o C)	140o F(60o C)	CHEMICAL	73o F(23o C)	140o F(60o C)
Acetic Acid, 20%	R	R	Diesel fuels	N	N
Acetic Acid, 80%	R	C			
Acetic Acid	R	R	Disodium Phosphate	R	R
			Diglycolic Acid	R	R
Ammonia, Gas	R	R			
Ammonia, Liquid	N	N	Detergent, aq	R	R
			Dichlorobenzene	N	N
Ammonium Salts	R	R		N	N
Ammonium Fluoride, 25%	R	C	Ethers	N	N
Benzene (Benzal)	N	N	Fatty Acids	R	R
Benzene Sulfonic Acid, 10%	R	R	Ferric Salts	R	R
Benzene Sulfonic Acid	N	N	Fluorine, Dry Gas	C	N
Benzonic Acid	R	R	Fluorine, Wet Gas	C	N
			Fluoboric Acid, 25%	C	R
Bleach, 12.5% Ative Chlorine	R	R			
Bleach, 5.5% Ative Chlorine	R	R	Formic Acid	R	N
Boric Acid	R	R	Fruit Juice and Pulps	R	R
			Fuel Oil	C	N
Bromic Acid	R	R	Furfural	N	N
			Gas, Coal, Manufactured	N	N
Calcium Salts, aq	R	R	Gas, Coal, Manufactured	R	R
Calcium Hypochlorite	R	R			
Calcium Hydroxide	R	R	Gasoline	C	C
Carbon Dioxide	R	R	Gelatin	R	R
Carbon Dioxide, aq	R	R	Glycerin (Glycerol)	R	R
Carbon Momoxide	R	R	Glycols	R	R
Castor Oil	R	R	Glycolic Acid	R	R
Causticpotash (Potassium Hydroxide)	R	R	Gallic Acid	R	R
Causticpotash (Sodium Hydroxide)	R	R			
			Hydrobromic Acid, 20%	R	R
Chloric Acid, 20%	R	R	Hydrochloric Acid	R	R
			Hydrogen	R	R
Chlorine, Gas, Dry	C	N	Hydrogenperoxide, 50%	R	R
Chlorine, Gas, Wet	N	N	Hydrogenperoxide, 90%	R	R
Chlorine, Liquid	N	N			
Chlorine, Water	R	R	Iodine, Alc	N	N
Chlorine, Acid	R	R	Jet Fuels, JP-4 and JP-5	R	R
Chlorosulfonic Acid	R	N	Kerosene	R	R
Chloromic Acid, 10%	R	R	Ketone	N	N
			Lastic Acid, 25%	R	R
Citric Acid, 50%	R	R			
Coconut Oil	R	R	Lead Salt	R	R
Coke Oven Gas	R	R	Linoleic Acid	R	R
			Linseed Oil	R	R
Copper Salt, aq	R	R			
Corn Oil	R	R	Lithium Salts	R	R
Corn Syrup	R	R	Lubricating Oils	R	R
Cresylic Acid, 50%	R	R	Machine Oil	R	R
Crude Oil	R	R	Magnesium Acid	R	R

R = Generally resistant
C = Less resistant than R but still suitable for some conditions
N = Not resistant
This table is meant to aid designer in decisions as to transporting / conveyance of undiluted chemicals.

PVC CHEMICAL RESISTANCE CHART

CHEMICAL	73o F(23o C)	140o F(60o C)	CHEMICAL	73o F(23o C)	140o F(60o C)
Mercuric Salts	R	R	Stannic Chloride	R	R
Mercury	R	R	Stannous Chloride	R	R
Metallic Soaps, aq	R	R	Starch	R	R
Methane	R	R	Stearic Acid	R	R
			Stoddard Solvent	N	N
Milk	R	R			
Mineral Oil	R	R	Sulfur	R	N
Mixed Acids (Sulfuric & Nitric)	C	N	Sugars, aq	R	N
Mixed Acids (Sulfuric & Phosphoric)	R	R	Sulfur Dioxide, Dry	R	N
			Sulfur Dioxide, Wet	R	C
Motor Oil	R	R			
			Sulfur Trioxide, Gas, Dry	R	R
Nickle Salt	R	R	Sulfur Trioxide, Wet	R	C
			Sulfuric Acid, up to 70%		
Nitric Acid, 0 to 50%	R	C	Sulfuric Acid, 70 to 90%	R	C
			Sulfuric Acid, 70 to 100%	C	N
Oil, Vegetable	R	R	Sulfurous Acid	C	N
Oils and Fats	R	R			
Oleic Acid	R	R	Tartic Acid	R	R
			Taetrachloroethance	C	C
Olive Oil	C	-	Tetraethly Lead	R	C
Oxygen, Gas	R	R	Terahydrofuran	N	N
			Thionyl Chloride	N	N
Paraffin	R	R			
Petroleum, Sour	R	R	Thread Currint Oils	R	-
Petroleum, Refined	R	R	Terpineol	C	C
			Titanium Tetrachloride	C	N
Phosphoric Acid	R	R	TolueuTetrachloride	N	N
Phosphorus, Yellow	C	R	Tributyl Phosphate	N	N
Phosphorus, Red	R	R			
			Tributyl Citrate	R	-
Photographic Chemicals, aq	R	R	Tricresyl Phosphate	N	N
Picric Acid	N	N	Trichloroacetic Acid	R	R
Potassium Salts, aq	R	R	Trichlorothylene	N	N
Sea Water	R	R	Urea	R	R
Salicylic Acid	R	R	Urine	R	R
Salicyladehyde	C	C			
Selenic Acid	R	R	Vaseline	N	R
Sewage, Residential	R	R	Vegetable Oil	R	N
Slicic Acid	R	R	Vinegar	R	R
Silicone Oil	R	R			
Silver Salts	R	N	Water, Distilled	R	R
Soap	R	R	Water, Fresh	R	R
Sodium Salts, aq, Except	R	R	Water, Mine	R	R
Sodium Chlorite	R	R	Water, Salt	R	R
Sodium Chlorite	R	C			
Sodium Dichromate, Acid	R	R			
Sodium Perborate	R	R	Zinc Salt	R	R

R = Generally resistant
C = Less resistant than R but still suitable for some conditions
N = Not resistant
This table is meant to aid designer in decisions as to transporting / conveyance of undiluted chemicals.

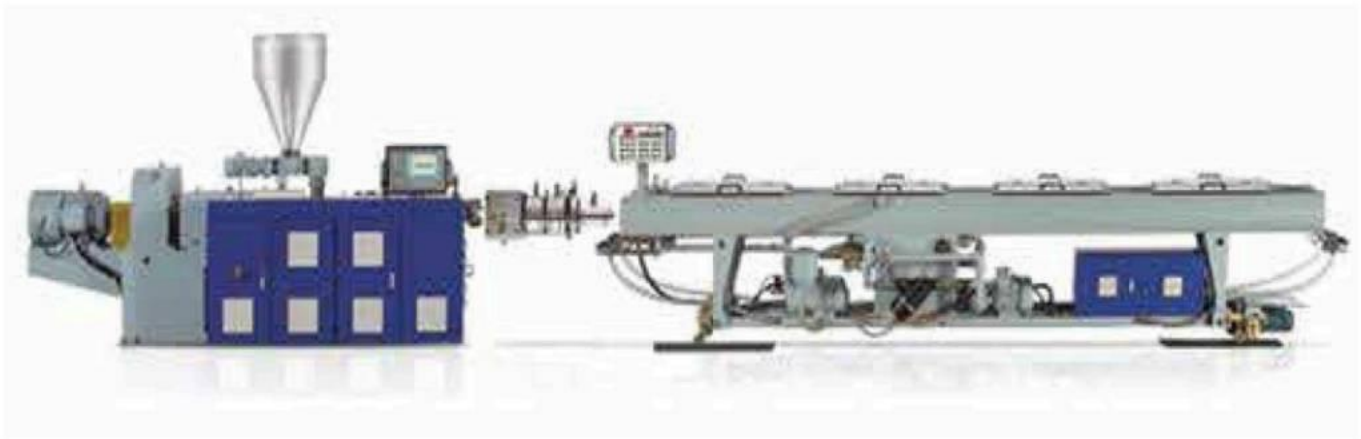
PVC PIPES PROCESS FLOW CHART

Raw Material Storage ⟵ PVC Compound Making ⟵ Hot & Cold Mixing ⟵ 

Storage

Feeding

Extruding ⟶ Sizing Calibrator ⟶ Vacuum Cooling Chamber









PVC PIPES PROCESS FLOW CHART

Dispatch



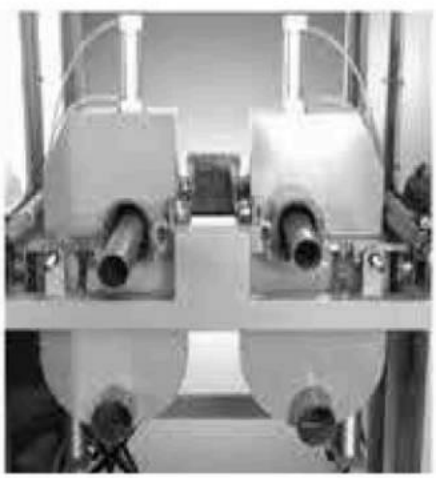
Storage



Printing → Huall off Unit → Cutting Unit → Piling Stand → Lab Inspection









STANDARD DIMENSIONS AND WEIGHTS

Standard Dimensions and weights of UPVC Pipes according to ASTM D-1785 Schedule-40

Nominal Pipe Size	Outside Diameter (mm)	Wall Thickness (mm)		Nominal Weight (kg/m)	Nominal Weight 6M Length (kg)	PSI
		Min.	Max.			
1/2"	21.34	2.77	3.28	0.24	1.44	600
3/4"	26.67	2.87	3.38	0.32	1.91	480
1"	33.40	3.38	3.89	0.47	2.81	450
1-1/4"	42.16	3.56	4.07	0.63	3.80	370
1-1/2"	48.26	3.68	4.19	0.75	4.52	330
2"	60.32	3.91	4.42	1.01	6.08	280
2-1/2"	73.02	5.16	5.77	1.60	9.60	300
3"	88.90	5.49	6.15	2.10	12.57	260
4"	114.30	6.02	6.73	2.98	17.90	220
5"	141.30	6.55	7.34	4.22	25.32	190
6"	168.28	7.11	7.97	5.26	31.54	180
8"	219.08	8.18	9.17	7.90	47.37	160
10"	273.05	9.27	10.39	11.21	67.25	140
12"	323.85	10.31	11.55	14.81	88.84	130

Pressure rating apply only to unthreaded pipes at 23 oC. Threading of Sch - 40 pipes is not recomended. The standard length is 6 meters.

Standard Dimensions and weights of CPVC Pipes according to ASTM F-441 Schedule - 40

Nominal Pipe Size	Outside Diameter (mm)	Wall Thickness (mm)		Nominal Weight (kg/m)	Nominal Weight 6M Length (kg)	PSI
		Min.	Max.			
1/2"	21.34	2.77	3.28	0.25	1.51	600
3/4"	26.67	2.87	3.38	0.34	2.05	480
1"	33.40	3.38	3.89	0.51	3.03	450

The standard length is 6 meters.


1
IBEX PVC 1/2 inch SCH-40


2
IBEX PVC 3/4 inch SCH-40


3
IBEX PVC 1 inch SCH-40


4
IBEX PVC 1-1/4 inch SCH-40


5
IBEX PVC 1-1/2 inch SCH-40


6
IBEX PVC 2 inch SCH-40


7
IBEX PVC 3 inch SCH-40


8
IBEX PVC 8 inch SCH-40


9
IBEX PVC 6 inch SCH-40


10
IBEX PVC 10 inch SCH-40


11
IBEX PVC 4 inch SCH-40


12
IBEX PVC 4 inch SCH-40

STANDARD DIMENSIONS AND WEIGHTS

Standard Dimensions and weights of UPVC Pipes according to ASTM D-1785 Schedule-40

Nominal Pipe Size	Outside Diameter (mm)	Wall Thickness (mm)		Nominal Weight (kg/m)	Nominal Weight 6M Length (kg)	PSI
		Min.	Max.			
1/2"	21.34	2.77	3.28	0.24	1.44	600
3/4"	26.67	2.87	3.38	0.32	1.91	480
1"	33.40	3.38	3.89	0.47	2.81	450
1-1/4"	42.16	3.56	4.07	0.63	3.80	370
1-1/2"	48.26	3.68	4.19	0.75	4.52	330
2"	60.32	3.91	4.42	1.01	6.08	280
2-1/2"	73.02	5.16	5.77	1.60	9.60	300
3"	88.90	5.49	6.15	2.10	12.57	260
4"	114.30	6.02	6.73	2.98	17.90	220
5"	141.30	6.55	7.34	4.22	25.32	190
6"	168.28	7.11	7.97	5.26	31.54	180
8"	219.08	8.18	9.17	7.90	47.37	160
10"	273.05	9.27	10.39	11.21	67.25	140
12"	323.85	10.31	11.55	14.81	88.84	130

Standard Dimensions and weights of UPVC Pipes according to ASTM D-2241 SDR-Series

Nominal Pipe Size	Outside Diameter (mm)	Wall Thickness (mm)		Nominal Weight (kg/m)	Nominal Weight 6M Length (kg)	PSI
		Min.	Max.			
2" SDR-26	60.32	2.31	2.82	0.77	4.60	160
3" SDR-32.5	88.90	2.74	3.25	1.09	6.55	125
4" SDR-41	114.30	2.79	3.30	1.67	10.00	100
5" SDR 41	141.40	3.45	3.95	2.44	14.65	100
6" SDR-41	168.28	4.11	4.62	3.45	20.67	100
8" SDR-41	219.08	5.34	5.98	5.99	35.94	100

Schedule 80 PVC and CPVC Pipe Dimensions, Weights and Maximum Operating Pressure

Nominal Pipe Size		Outside Diameter		Wall Thickness		Approx. Inside Diameter	Nominal Weight (kg/m)		Maximum permissible pressure
inch	mm	mm		mm		mm	PVC	CPVC	MPa
1/2"	15	21.34	±0.10	3.73	+0.51	13.4	0.311	0.337	1.25
3/4"	20	26.67	±0.10	3.91	+0.51	18.3	0.421	0.457	1.25
1"	25	33.40	±0.13	4.55	+0.53	23.8	0.618	0.670	1.25
1-1/4"	32	42.16	±0.13	4.85	+0.58	31.9	0.855	0.927	1.25
1-1/2"	40	48.26	±0.15	5.08	+0.61	37.5	1.037	1.124	1.25
2"	50	60.32	±0.15	5.54	+0.66	48.6	1.435	1.556	1.25
2-1/2"	65	73.02	±0.18	7.01	+0.84	58.2	2.190	2.373	1.25
3"	80	88.90	±0.20	7.62	+0.91	72.8	2.932	3.178	1.25
4"	100	114.30	±0.23	8.56	+1.02	96.2	4.288	4.648	1.25
5"	125	141.30	±0.25	9.53	+1.14	121.1	5.950	6.450	1.25
6"	150	168.28	±0.28	10.97	+1.32	145.0	8.186	8.873	1.25
8"	200	219.08	±0.38	12.70	+1.52	192.2	12.433	13.477	1.00

Standard Dimensions of UPVC Underground Drainage Pipes according to BS 4660:1973

Nominal Pipe Size	Mean Outside Diameter (mm)		Extreme Individual Outside Diameter (mm)		Minimum Wall Weight Thickness other than sockets (mm)
	Min.	Max.	Min.	Max.	
110.0	110.0	110.4	108.0	112.4	3.2
160.0	160.0	160.6	157.1	163.5	4.1

The standard length is 6 meters.

Standard Dimensions of Electrical Conduit Pipe according to BS 6099.

Nominal Diameter	Mean Outside Diameter (mm)		Wall Thickness (mm)	Allowed Tolerance	Weight kg / mtr
	Min	Max			
1/2"	17.0	17.3	1.04	±0.02	0.086
3/4"	21.2	21.5	1.23	±0.02	0.125
1"	26.6	26.9	1.33	±0.02	0.173
1-1/4"	33.4	33.7	1.51	±0.02	0.245
1-1/2"	42.1	42.4	1.85	±0.02	0.398
2"	60.2	60.5	2.03	±0.02	0.612
3"	88.7	89.1	1.80	±0.02	0.798
4"	114.1	114.5	1.80	±0.02	1.032

STANDARD DIMENSIONS AND WEIGHTS

Standard Dimension of PVC pipe as per PS 3051/ BS 3505

Nominal Size Inches	Mean Outside Dia Meter in (mm)		Class-B 6-0 Bar Individual Value (mm)		Class-C 9-0 Bar Individual Value (mm)		Class-D 12-0 Bar Individual Value (mm)		Class-E 15-0 Bar Individual Value (mm)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
1/2"	21.2	21.5							1.7	2.1
3/4"	26.6	26.9							1.9	2.5
1"	33.4	33.7							2.2	2.7
1-1/4"	42.1	42.4					2.2	2.7	2.7	3.2
1-1/2"	48.1	48.4					2.5	3.0	3.1	3.7
2"	60.2	60.5			2.5	3.0	3.1	3.7	3.9	4.5
2-1/2"	75.0	75.3			3.0	3.5	3.9	4.5	4.8	5.5
3"	88.7	89.1	2.9	3.4	3.5	4.1	4.6	5.3	5.7	6.6
4"	114.1	114.5	3.4	4.0	4.5	5.2	6.0	6.9	7.3	8.4
5"	140.0	140.4	3.8	4.4	5.5	6.4	7.3	8.4	9.0	10.4
6"	168.0	168.5	4.5	5.2	6.6	7.6	8.8	10.2	10.8	12.5
8"	218.8	219.5	5.3	6.1	7.8	9.0	10.3	11.9	12.6	14.5
10"	272.6	273.5	6.6	7.6	9.7	11.2	12.8	14.8	15.7	18.1
12"	323.4	324.3	7.8	9.0	11.5	13.3	15.2	17.5	18.7	21.6

1. Pipes upto 6" are normally available from stock.

2. Standard length is 6 meters, other length can be manufactured.

3. Pipes of nominal Dia or above 6" are normally stocked at the end (to suit either rubbing or solvent cement joint).

STANDARD DIMENSIONS AND WEIGHTS

Standard weight of PVC pipe as per PS 3051/ BS 3505

Nominal Size		Class-B			Class-C			Class-D			Class-E		
Inch	mm	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
		(kg/m)			(kg/m)			(kg/m)			(kg/m)		
1/2"	21.34							0.13	0.15	0.14	0.15	0.17	0.16
3/4"	26.67							0.17	0.21	0.19	0.21	0.23	0.22
1"	33.40							0.27	0.32	0.29	0.31	0.34	0.32
1-1/4"	42.16							0.39	0.43	0.41	0.48	0.53	0.50
1-1/2"	48.26							0.51	0.57	0.54	0.63	0.69	0.66
2"	60.32				0.65	0.73	0.69	0.80	0.87	0.83	0.99	1.09	1.04
2-1/2"	73.02				0.97	1.07	1.02	1.25	1.38	1.31	1.52	1.67	1.60
3"	88.90	1.12	1.27	1.20	1.34	1.49	1.42	1.74	1.93	1.83	2.13	2.35	2.24
4"	114.30	1.69	1.89	1.79	2.22	2.46	2.34	2.91	3.20	3.06	3.50	3.83	3.67
5"	140.30	2.33	2.50	2.40	3.43	3.63	3.53	4.36	4.56	4.46	5.45	5.65	5.55
6"	168.28	3.30	3.68	3.49	4.72	5.29	5.00	6.30	6.93	6.61	7.63	8.38	8.01
8"	219.08	5.09	5.57	5.33	7.40	8.15	7.77	9.66	10.57	10.11	11.68	12.84	12.26
10"	273.05	7.89	8.73	8.31	11.47	12.64	12.05	14.95	16.44	15.69	18.13	19.92	19.03
12"	323.85	11.07	12.21	11.64	16.13	17.79	16.96	21.06	23.10	22.08	25.62	28.13	26.87

All weights are in (Kg/m)

PS 3051 (BS 3505) does not spell out any figures for weights. The pipe weights are depend on the formulation, density and tolerance.

Approximate weights for PVC Pipes for transportation and other estimation purposes are given.

STANDARD DIMENSIONS AND WEIGHTS

PPRC PIPES

Technical Specifications

SDR 11 (PN10)

Outside Ø mm.	Tolerance mm.	Thickness mm.	Tolerance mm.	Inside Ø mm.	In" inches
20	+0.3/-0	1.9	+0.3/-0	16.20	1/2"
25	+0.3/-0	2.3	+0.4/-0	20.40	3/4"
32	+0.3/-0	2.9	+0.4/-0	26.20	1"
40	+0.4/-0	3.7	+0.5/-0	32.60	1 1/4"
50	+0.5/-0	4.6	+0.6/-0	40.80	1 1/2"
63	+0.6/-0	5.8	+0.7/-0	51.40	2"
75	+0.7/-0	6.8	+0.8/-0	61.40	2 1/2"
90	+0.9/-0	8.2	+1.0/-0	73.60	3"
110	+1.0/-0	10.0	+1.1/-0	90.00	4"
125	+1.2/-0	11.4	+1.3/-0	102.20	5"

SDR 7,4 (PN16)

Outside Ø mm.	Tolerance mm.	Thickness mm.	Tolerance mm.	Inside Ø mm.	In" inches
20	+0.3/-0	2.8	+0.4/-0	14.00	1/2"
25	+0.3/-0	3.5	+0.5/-0	18.00	3/4"
32	+0.3/-0	4.4	+0.6/-0	23.20	1"
40	+0.4/-0	5.5	+0.7/-0	29.00	1 1/4"
50	+0.5/-0	6.9	+0.8/-0	36.20	1 1/2"
63	+0.6/-0	8.6	+1.0/-0	45.80	2"
75	+0.7/-0	10.3	+1.2/-0	54.40	2 1/2"
90	+0.9/-0	12.3	+1.4/-0	65.40	3"
110	+1.0/-0	15.1	+1.7/-0	79.80	4"
125	+1.2/-0	17.1	+1.9/-0	90.80	5"

SDR 6 (PN20)

Outside Ø mm.	Tolerance mm.	Thickness mm.	Tolerance mm.	Inside Ø mm.	In" inches
20	+0.3/-0	3.4	+0.5/-0	13.20	1/2"
25	+0.3/-0	4.2	+0.6/-0	16.60	3/4"
32	+0.3/-0	5.4	+0.7/-0	21.20	1"
40	+0.4/-0	6.7	+0.8/-0	26.60	1 1/4"
50	+0.5/-0	8.3	+1.0/-0	33.40	1 1/2"
63	+0.6/-0	10.5	+1.2/-0	42.00	2"
75	+0.7/-0	12.5	+1.4/-0	50.00	2 1/2"
90	+0.9/-0	15.0	+1.7/-0	60.00	3"
110	+1.0/-0	18.3	+2.0/-0	73.40	4"
125	+1.2/-0	20.8	+2.2/-0	83.40	5"

Technical Specifications

Characteristics		Unit	Test Method	Values
Density	+23°C	g/cm3	ISO 1183	0,909
Melt Flow Index (MFI)	190 °C /5 kg	g/10 min	ISO 1133	0,4-0,6
	230°C /2,16 kg	g/10 min	ISO 1133	0,2-0,5
	230°C /5 kg	g/10 min	ISO 1133	0,8-1,3
Tensile Stress at yield (23°C)	(50 mm/min)	MPa	ISO 527	25
Tensile Strain at Yield	(50 mm/min)	%	ISO 527	10
Flexural Modules	+23°C	N/mm²	ISO 527	800
Charpy Impact Strength (notched)	+23°C	kJ/m²	ISO 179	>15
	0°C	kJ/m²	ISO 179	>5
Charpy Impact Strength (unnotched)	0°C	kJ/m²	ISO 179	No break
Vicat Softening Point	(1 kg)	°C	ASTM D 1525 ISO 306 DIN 53460	130
	(5 kg)	°C		60
Melting Range		°C	Polarizing Microscope	140-150
Linear Thermal Expansion Co-efficient		1/K	DIN 53752	1,5x10-4
Thermal Conductivity		W/mK	DIN 52612	0,24
Hardness (Shore D)	(3 sec value)		ISO 868	65
Pipe Friction Factor				0,007

Mechanical characteristics of tubular test pieces made of PPR by injection moulding (TS EN ISO 15874-3)

Characteristic	Requirement	Test parameters for the individual tests PPR					Test method
		Hydrostatic Stress (Mpa)	Test Temp. (C°)	Test Period (h)	Number of test pieces	Test Pressure (Bar)	
Resistance to İnternal pressure	No failure during the test period	16,0	20	1	3	53,1	ISO 1167-1 ISO 1167-3
		3,5	95	1000	3	11,6	

Mechanical characteristics of pipes (TS EN ISO 15874-2)

Characteristic	Requirement	Test parameters for the individual tests PPR					Test method
		Hydrostatic Stress (Mpa)	Test Temp. (C°)	Test Period (h)	Number of test pieces	Test Pressure (Bar)	
Resistance to İnternal pressure	No failure during the test period	16,0	20	1	3	64	ISO 1167-1 ISO 1167-2
		4,3	95	22	3	17,2	
		3.8	95	165	3	15,2	
		3,5	95	1000	3	14	

STANDARD DIMENSIONS AND WEIGHTS

HDPE 100 Pipe

Technical Specifications

S.No.	Dia (mm)	Diameter Tolerance (mm)			SDR 11 PN-16 Wall Thickness (mm)			SDR 13.6 PN12.5 Wall Thickness (mm)		
		Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
1	20	20.00	20.3	20.15	1.9	2.3	2.1	1.80	2.20	2.00
2	25	25.00	25.3	25.15	2.3	2.8	2.55	2.00	2.30	2.15
3	32	32.00	32.3	32.15	2.9	3.4	3.15	2.40	2.80	2.60
4	40	40.00	40.4	40.2	3.7	4.3	4	3.00	3.50	3.25
5	50	50.00	50.50	50.25	4.60	5.40	5.00	3.70	4.20	3.95
6	63	63.00	63.60	63.30	5.80	6.60	6.20	4.70	5.30	5.00
7	75	75.00	75.70	75.35	6.80	7.80	7.30	5.60	6.30	5.95
8	90	90.00	90.90	90.45	8.20	9.30	8.75	6.70	7.50	7.10
9	110	110.00	111.00	110.50	10.00	11.20	10.60	8.10	9.10	8.60
10	125	125.00	126.20	125.60	11.40	12.80	12.10	9.20	10.30	9.75
11	140	140.00	141.30	140.65	12.70	14.20	13.45	10.30	11.50	10.90
12	160	160.00	161.50	160.75	14.60	16.30	15.45	11.80	13.10	12.45
13	180	180.00	181.70	180.85	16.40	18.30	17.35	13.30	14.80	14.05
14	200	200.00	201.80	200.90	18.20	20.30	19.25	14.70	16.30	15.50
15	225	225.00	227.10	226.05	20.50	22.80	21.65	16.60	18.40	17.50
16	250	250.00	252.30	251.15	22.70	25.20	23.95	18.40	20.40	19.40
17	280	280.00	282.60	281.30	25.40	28.20	26.80	20.60	22.80	21.70
18	315	315.00	317.90	316.45	28.60	31.70	30.15	23.20	25.70	24.45
19	355	355.00	358.20	356.60	32.20	35.70	33.95	26.10	28.90	27.50
20	400	400.00	403.60	401.80	36.30	40.20	38.25	29.40	32.50	30.95
21	450	450.00	453.80	451.90	40.90	45.20	43.05	33.10	36.60	34.85
22	500	500.00	504.00	502.00	45.40	50.20	47.80	36.80	40.60	38.70
23	560	560.00	564.30	562.15	50.80	56.10	53.45	41.20	45.50	43.35
24	630	630.00	634.60	632.30	57.20	63.20	60.20	46.30	51.10	48.70
25	710	710.00	714.90	712.45	79.30	87.40	60.20	52.20	57.60	54.90
26	800	800.00	805.00	802.50	89.30	98.40	60.20	58.80	64.80	61.80
27	900	900.00	908.10	904.05	-	-	-	66.20	73.00	69.60
28	1000	1000.00	1009.00	1004.50	-	-	-	72.50	79.90	76.20
29	1200	1200.00	1210.80	1205.40	-	-	-	88.20	97.20	92.70
30	1400	1400.00	1412.60	1406.30	-	-	-	102.90	113.30	108.10
31	1600	1600.00	1614.40	1607.20	-	-	-	117.60	129.50	123.55

Technical Specifications

SDR 17 PN-10			SDR 21 PN-8.0			SDR 33 PN-6.0		
Wall Thickness (mm)			Wall Thickness (mm)			Wall Thickness (mm)		
Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
-	-	-	-	-	-	-	-	-
1.80	2.20	2	-	-	-	-	-	-
2.00	2.30	2.15	-	-	-	-	-	-
2.40	2.80	2.6	2.00	2.30	2.15	-	-	-
3.00	3.40	3.20	2.40	2.80	2.60	2.00	2.30	2.15
3.80	4.30	4.50	3.00	3.40	3.20	2.50	2.90	2.70
4.50	5.10	4.80	3.60	4.10	3.85	2.90	3.30	3.10
5.40	6.10	5.75	4.30	4.90	4.60	3.50	4.00	3.75
6.60	7.40	7.00	5.30	6.00	5.65	4.20	4.80	4.50
7.40	8.40	7.90	6.00	6.70	6.35	4.80	5.40	5.10
8.30	9.30	8.80	6.70	7.50	7.10	5.40	6.10	5.75
9.50	10.60	10.05	7.70	8.60	8.15	6.20	7.00	6.60
10.70	11.90	11.30	8.60	9.60	9.10	6.90	7.70	7.30
11.90	13.20	12.55	9.60	10.70	10.15	7.70	8.60	8.15
13.40	14.90	14.15	10.80	12.00	11.40	8.60	9.60	9.10
14.80	16.40	15.60	11.90	13.20	12.55	9.60	10.70	10.15
16.60	18.40	17.50	13.40	14.90	14.15	10.70	11.90	11.30
18.70	20.70	19.70	15.00	16.60	15.80	12.10	13.50	12.80
21.10	23.50	22.30	16.90	18.70	17.80	13.60	15.10	14.35
23.70	26.20	24.95	19.10	21.20	20.15	15.30	17.00	16.15
26.70.	29.50	28.10	21.50	23.80	22.65	17.20	19.10	18.15
29.70	32.80	31.25	23.90	26.40	25.15	19.10	21.20	20.15
33.20	36.70	34.95	26.70	29.50	28.10	21.40	23.70	22.55
37.40	41.30	39.35	30.00	33.10	31.55	24.10	26.70	25.40
42.10	46.50	44.30	33.90	37.40	35.65	27.20	30.10	28.65
47.40	52.30	49.85	38.10	42.10	40.10	30.60	33.80	32.20
53.30	58.80	56.05	42.90	47.30	45.10	34.40	38.30	36.35
59.30	65.50	62.35	47.70	52.60	50.15	38.20	42.20	40.20
67.90	74.80	71.35	57.20	63.10	60.15	45.90	50.60	28.25
82.40	90.80	86.60	66.70	73.50	70.10	53.50	59.00	56.25
94.10	103.70	98.90	76.20	84.00	80.10	61.20	67.50	64.35

STORAGE & HANDLING

STORAGE

• The pipes should be kept on a flat surface or on level ground free from stones and sharp objects.

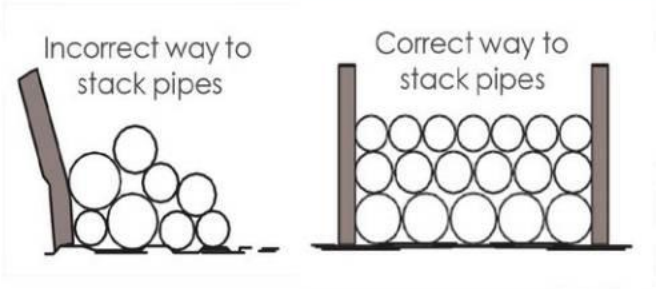
• The maximum stack should be 7 layers high under normal conditions and 6 layers high in hot condition.

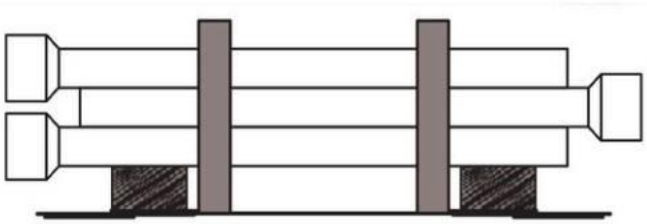
• Ideally a stack should contain pipes of the same diameter. If this is not possible nesting of smaller pipes inside the large pipes may be done. The large diameter pipes should always be kept at the bottom of the stack.

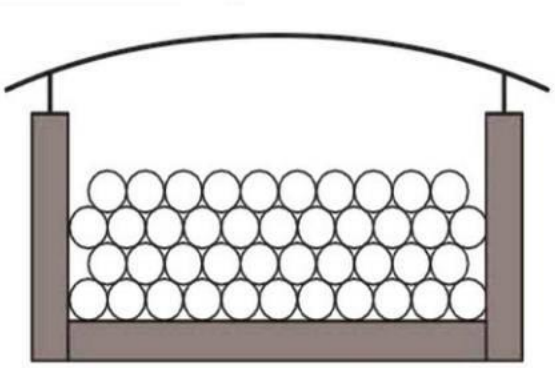
• Direct exposure to sunlight can affect the pipes and fittings, causing decolouration and deterioration in the seal ring.

• It is recommended that the pipes should not exposed to direct sunlight and kept in open for longer periods of direct sunlight, it should be covered by opaque sheets.

• While storing socketed pipes, it is recom- mended that alternate layers should have the sockets in the opposite direction.







HANDLING

• Responsible care should be taken while handling of pipes. During unloading from vehicles, pipes should not be dropped/mishandled from the vehicle.

• Pipe should never be dragged along hard surfaces. In case of mechanical lifting, avoid using metal chains and hooks in direct contact with the pipes. It is recommended to provide protected sings and pads supports.

SOLVENT CEMENT JOINTING

All burrs from the internal and external surfaces should be removed.	The spigot should be marked with a pencil line at a distance equivalent to the socket depth. Clean the surface within the marked area.
Apply uniform coat of solvent cement on the external surface of the pipe and a lighter coat on the internal surface of the fitting.	Insert the pipe end into the socket of the fitting and push it in upto the mark.
Remove the excess solvent cement and hold the joint firmly in position for 30 seconds to dry.	

RUBBER RINGT JOINTING

Chamfer the end of the pipe. Remove all burns, dust and dirt.	Apply lubricant on the external surface of the chamfered end of the pipe and on the rubber gasket.
Check that the ring seal is in position in the housing.	Push the pipe fully into the socket and mark the pipe depth in the socket with marker.
Withdraw the pipe until the mark is 12 mm away from the socket before fixing. This gap between the pipe end and the socket register is very essential for thermal expansion/contraction.	


EMARAAT
WHERE AFFORDABILITY MEETS DURABILITY



A product of

MAQ
ENTERPRISES

D-154, Manghopir Road, S.I.T.E
Karachi, Pakistan
Infoatmaq@gmail.com